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ABSTRACT

This module on multiple sclerosis is intended for use in inservice or continuing education programs for persons who administer medications in long-term care facilities. Instructor information, including teaching suggestions, and a listing of recommended audiovisual materials and their sources appear first. The module goal and objectives are then provided. A brief discussion follows of the disease process of multiple sclerosis, the commonly used drugs for treatment, and considerations and suggestions for resident care. This discussion is intended for use as a lecture or participant reading. Other contents include a vocabulary list, a worksheet, and a drug chart, all of which are suitable for reproduction for use as handouts. (YLB)

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MULTIPLE SCLEROSIS

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Multiple Sclerosis

Instructor Information

This module was prepared for use in inservice or continuing education programs in a long term care facility. It briefly describes the disease process of M.S. and the commonly used drugs for treatment. A drug chart and worksheet can be duplicated for the participant.

Audio/Visual Material

There is no charge for pamphlets from the National Multiple Sclerosis Society, 205 E. 42nd St., New York, NY 10017.

Multiple Sclerosis (M.S.)

Goal

The resident with M.S. must deal with emotional as well as physiological problems. The health care worker needs to understand the process of this disease, as well as the effects of the medication used in treatment. Exacerbations and remissions cause the patient to develop many coping mechanisms. To aid the resident with M.S., the health care worker needs a thorough understanding of this process as well. After completing this module, the health care worker will:

- Describe the disease process of multiple sclerosis
- Identify four drugs commonly used to treat M.S.
- List the side effects of corticosteroid therapy
- Complete the worksheet with the instructor
- Increase word power by learning the definitions in the vocabulary

"M.S."—What Is It?

M.S., or multiple sclerosis, is the most common disease of the central nervous system involving young adults between the ages of 20 and 40 in the United States.

The disease involves "sclerosed" or hardened areas of tissue in the nerves of the brain and spinal cord. There may be many scattered areas affected, so that the symptoms can be mild to severe and may come (*exacerbation*) or go (*remission*).

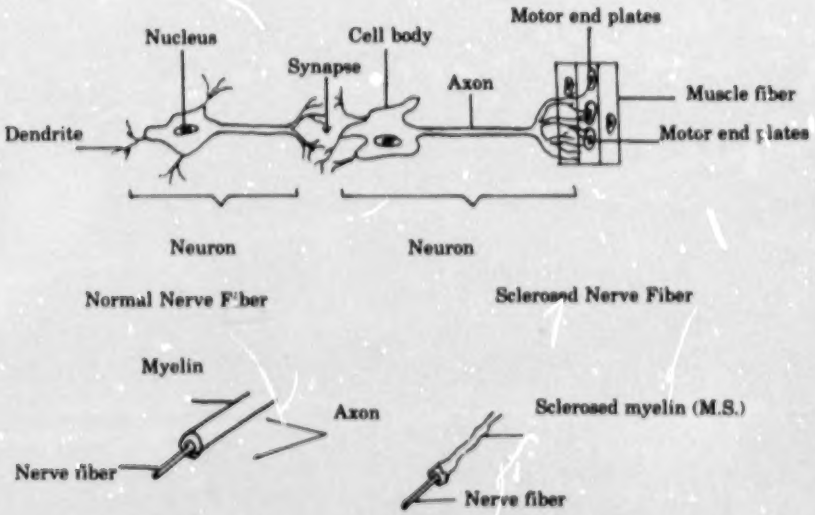
M.S. and the Central Nervous System (C.N.S.)

The C.N.S., consisting of the brain and spinal cord, is the communication center of the body. Through it we receive and react to messages from the outside world.

The C.N.S. is composed of nerve cells called *neurons*. The nerve cells or fibers can be thought of as wires or electrical cords which transmit messages to and from the communication center or brain and spinal cord. Just as electrical wires are insulated, or covered with a protective material, so are the nerves in the body. This protection which surrounds the nerve is called *myelin*. Myelin is a fatty substance which allows the message or nerve "impulse" to flow smoothly without interruption or "shorting out."

In multiple sclerosis, the myelin breaks down and the fatty covering is replaced by scar tissue. This scar tissue can block and interrupt the flow of messages to and from the central nervous system. As a result, the messages do not come through correctly, or they may detour and go to the wrong area.

Neurons are nerve cells which receive and transmit impulses at the synaptic junction. As an impulse passes along a nerve fiber, chemicals called neurotransmitters are released at the synapse. These chemicals cross the synapse and cause the transmission or blockage of messages.



Causes of M.S.

The specific cause of M.S. in unknown, but scientists have developed several theories. M.S. may be caused by:

- A slow acting virus which stays in the body for years before producing illness
- The body's defense system breaking down and beginning to attack its own tissue
- The body's defense system becoming confused when it is attacked by a virus and the defense system attacking both the body and the virus

Symptoms of M.S.

The symptoms of multiple sclerosis are many and unpredictable. A combination of three or more of the following symptoms or succession of these symptoms may indicate M.S. The early symptoms are slight and go away, but come back later and are more severe.

- Eye problems - problems with vision or control of eye movements
- Partial or complete paralysis of any body part
- Shaking of hands
- Slurred speech
- Extreme weakness
- Loss of coordination
- Loss of bowel and bladder control
- Numbness or prickly feeling in feet, hands, arms, etc.
- Staggering gait
- Dragging of feet

The symptoms of M.S. may disappear for weeks or years. Mild M.S. occurs in one of three patients and presents few serious symptoms for many years. Three out of four M.S. patients can take care of their daily needs, and life span of the patient with M.S. is near normal.

Complications of M.S.

Patients with M.S. may develop:

- Contracture from muscle spasticity
- Decubitus ulcers from sensory loss to skin pressure
- Inability to coordinate movements
- Bladder and bowel dysfunction with resultant renal failure
- Eye defects leading to blindness

Drug Treatment

Muscle relaxants — muscles are innervated by nerve fibers which, when stimulated, will cause the muscle to contract or relax. Movement is caused by stimulation of motor nerves which pass through the spinal cord and connect with the muscle fibers. The area where the nerve connects with the muscle fiber is called the myoneural junction. At this point, a chemical called acetycholine is produced. This substance allows the nerve impulse to travel from the motor nerve to the muscle.

In multiple scleorosis, muscle spasm can severely limit one's ability to care for oneself. Specific drugs used in the treatment of M.S. for muscle spasm are baclofen (Lioresal) and dantrolene (Dantrium).

Dantrium acts within the muscle fibers of the affected part.

Lioresal acts on the brain and spinal cord by depressing transmission of nerve impulses from the spinal cord to skeletal muscle.

ACTH or Corticosteroids

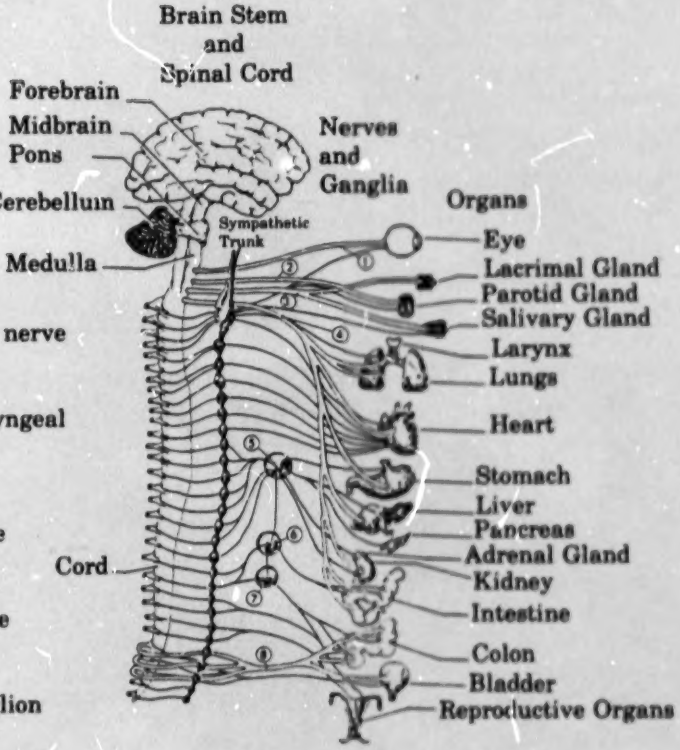
These may reduce severity and duration of acute attacks by reducing inflammation in nerves and muscle fibers. Corticosteroids have many side effects:

- Sodium and water retention
- G.I. disturbances, n/v, ulcers, bleeding
- Skin changes, ecchymosis (bruising) and petichiae (tiny red spots), acne
- Hormonal imbalance
- Moon face — edema, weight gain, oily skin
- Metabolism — hyperglycemia
- Increases intraocular eye pressure
- Musculoskeletal defects — bone fractures
- Mood swings
- Superimposed infections
- Physical and psychological dependence

The Nervous System

Function:

1. **Controls Body Activities**
2. **Coordinates Body Activities**



Care of the Resident with M.S.

Considerations	Suggestions
Keep resident as independent as possible.	Teach how to use self help devices and transfer activities.
Nerves affecting sight and speech may be damaged by M.S.	Eye patch or frosted lens can be utilized if pt. c/o double vision. If speech cannot be understood, have patient communicate needs by writing.
Resident may have sensory loss, decubitus ulcers apparent.	Change position every two hours. Inspect common pressure areas (sacrum, heels, elbows, shoulders, hips). Flotation pad, sheepskin alternating air pressure mattress may relieve pressure.
Muscles may become rigid (spastic).	Active and/or passive range of motion exercises may minimize joint contractures.
Bladder incontinence or retention may cause urinary tract infections.	Encourage fluids to reduce bacterial count and prevent crystals from forming. Encourage routine voiding schedule.
Bowel incontinence may necessitate a bowel program.	Regularity in evacuating the bowels can be established by: • regularly scheduled meals • prune juice at bedtime • use of suppository 30 minutes after breakfast per doctor's orders • teaching patient to compress abdomen with hands to assist with defecation.

Considerations	Suggestions
The resident receiving corticosteroid therapy may develop sodium and water retention.	Check B/P regularly. Observe for tight clothes, rings and shoes, daily weight, and intake and output records may help determine fluid retention.
Corticosteroid therapy may cause GI disturbances.	Medication should be taken with milk or food. Watch for tarry stools and c/o abdominal pain.
Metabolic effects of steroids may cause hyperglycemia.	The urine may be checked for sugar and acetone.
Corticosteroids cause an increase in intraocular pressure.	Inquire about history of eye disorders such as glaucoma and cataracts.
Steroids mask symptoms of infections.	Follow strict handwashing technique; protect patient from transfer of infectious organisms.

Vocabulary

sclerosis — scarring or hardening
neuron — nerve cell, smallest functional unit of the nervous system
neurotransmitter — chemical which transmits or blocks nerve impulses at the synapse
synapse — junction between the axon and dendrite bathed in chemicals called neurotransmitters
M.S. — multiple sclerosis
myelin — sheath like covering composed of a fatty substance which insulates the axon
axon — nerve fiber which can be very short or extremely long, along which nerve impulses pass
C.N.S. — central nervous system composed of the brain and spinal cord
myoneural synapse — the junction where the nerve fiber and muscle fiber joins, which activates or relaxes the muscle fiber
spasticity — involuntary contraction of muscle fibers

Worksheet

Choose the most correct answer by circling a, b, c, or d.

1. Corticosteroid medications are given to the patient with M.S. in order to:
   a. relieve muscle spasm
   b. cure the disease process
   c. induce remission
   d. shorten periods of exacerbations

2. The resident who is experiencing a remission of symptoms will probably:
   a. be extremely lethargic
   b. have many symptoms
   c. require more medication
   d. require less medication

3. During Corticosteroid therapy, the patient may experience:
   a. hypoglycemia
   b. hyperglycemia

4. Specific drugs for the treatment of spasticity are:
   a. antispasmolytics
   b. muscle-relaxants
   c. tranquilizers
   d. Corticosteroids

5. Residents with multiple sclerosis may develop decubiti due to:
   a. incontinence
   b. sensory loss
   c. spasticity
   d. lack of exercise

6. The resident with multiple sclerosis who is on Corticosteroid therapy may develop eye problems due to:
   a. increased ocular pressure
   b. decreased ocular pressure
   c. extrocular eye movements

Skeletal Muscle Relaxants

Relieves acute muscle spasm by acting on the CNS

Drug	Side Effects	Interacts With	To Produce	Remember
Baclofen Lioresal	Drowsiness Headache Dizziness Confusion Insomnia Low B/P N/V Constipation frequency Rash Increased blood sugar Edema Perspiration	None	None	Give with meals to prevent gastric distress. May cause increased seizures in epileptics. Observe for fever, skin eruptions, respiratory distress. May cause hallucinations; do not withdraw abruptly.
Dantrolene Dantrium	Muscle weakness Confusion Nervousness Insomnia Speech disturbances Tachycardia Phlebitis Excessive tearing Diarrhea Constipation incontinence Crystals in urine Rash Eczema Hair growth Drooling Sweating Fever Photosensitivity Liver damage	None	None	Observe for fever, jaundice. Observe for respiratory distress. Safety in long term use not established — not to be given for more than 45 days if no benefits are observed. Use sunscreen agents. Report abdominal discomfort. Use cautiously in patients with cardiac or pulmonary problems, liver disease, and patients over 35. Use cautiously with tranquilizers.

Corticosteroids (glucocorticoids)

Glucocorticoids – synthetic hormone which reduces inflammation

Drug	Side Effects	Interacts With	To Produce	Remember
Dexamethasone Decadron **Prednisolone** Deltasone Meticorten **Triamcinolone** Aristocort Kenacort **Methylprednisolone** Medrol **Hydrocortisone** Hydrocortone	Headache Depression Euphoria Convulsions Psychotic behavior Hypertension CHF Cataracts Glaucoma Ulcers GI bleeding Hyperglycemia Fluid retention Acne Hair growth Psychological and physical tolerance Skin easily bruised	**Barbiturates** Seconal Phenobarbital Amytal **Phenytoin** Dilantin **Rifampin** Rifadin Rimactane	Decreased corticosteroid effect	Check urine for sugar. Give with food when possible. May mask symptoms of infection. Observe patient for edema. Monitor B/P. Observe for depression or psychosis. Use cautiously in patients with diabetes, high B/P, GI disease, renal disease, cancer, blood disorders, TB, congestive heart failure.
		Indomethacin Indocin ASA	Increased risk of GI bleeding	
		Methandrostenolone Dianabol	Enhanced corticosteroid response	